

the danger point of binding as a single volume. This led to the decision, since the present edition might contain in all more than 90,000 names, that it should be issued in three volumes: volume I, *The Physical Sciences*; volume II, *The Biological Sciences*; and volume III, *The Social and Behavioral Sciences*. From the standpoint of optimum convenience, it is unfortunate that all American men of science can no longer be listed in a single volume. This is, of course, a commentary on the Gargantuan growth of American science in the past half-century: even the mechanics of modern printing and binding cannot keep pace with it.

The preparation of three volumes for the listing of present-day scientists led to difficult decisions concerning which volume was most appropriate for some individual listings. For example, medical scientists are included in *The Biological Sciences*, and, since psychiatrists are medical men, their names appear in this volume. This is true even in the case of psychiatrists primarily interested in "social psychiatry" and the social sciences in general. On the other hand, most psychologists appear in *The Social and Behavioral Sciences*. This means that, except for a handful of experimental psychologists who are active in various biological scientific societies and, hence, appear in volume II, most of the physiologically oriented psychologists of the country appear in *The Social and Behavioral Sciences*. A similar comment may be made in regard to some geographers. These statements are not made in criticism of the classifications used in the three volumes, because such problems are inevitable when an editor must deal with the classification of research men and scholars according to named areas of research.

The biographies are presented in a standard form. The criteria on which names are included and the biographical facts given are, as the present editor points out, very similar to those used by his father in the first edition, 50 years ago. An excellent table of abbreviations is given.

Considerable care has been exercised by the editor to provide the type face and the spaces necessary to make the material presented in this well-bound book as legible as possible, in view of the need for economy of paper that was, of course, paramount.

The scientific and academic world owes the editor of this volume and of the two preceding volumes of the ninth edition a debt of gratitude. He has performed a notable service for the American learned world in issuing, in convenient form, this large and valuable work of reference.

LEONARD CARMICHAEL  
*Smithsonian Institution*

#### British Scientific and Technical Books.

A selected list of recommended books published in Great Britain and the Commonwealth in the years 1935–1952. Published for Aslib. Clarke, London; Hafner, New York, 1956. 364 pp. \$11.25.

This bibliography includes "the most important and useful books on science and technology published in the United Kingdom and the Dominions between 1935 and 1952." Books in the pure and applied sciences are included, together with those publications in psychology, documentation, architecture, and photography that are deemed to be of interest to technical readers. Economic and social sciences have been excluded, and such scientifically peripheral subjects as gardening and domestic science are covered less thoroughly than are the strictly technical subjects. The main body of the bibliography is arranged according to the Universal Decimal classification. In addition, there are author and title indexes and there is a list of publishers.

**UNESCO Source Book for Science Teaching.** United Nations Educational, Scientific, and Cultural Organization, Paris, 1956. 222 pp. Illus. \$3.

This book, which is essentially a laboratory manual for elementary science instruction, is an outgrowth of a UNESCO book prepared by J. P. Stephenson, science master at the City of London school, shortly after the end of World War II under the title *Suggestions for Science Teachers in Devastated Countries*. The original went through several editions and was translated into French, Spanish, Chinese, Thai, and Arabic. The experience of science teachers sent into the field by UNESCO led to the devising of new experiments and the adaptation of new materials for science instruction.

The book abounds in examples of the ingenious transformation of the refuse of civilization into usable, even though crude, laboratory instruments. These, supplemented by a few tools and inexpensive materials from the hardware store, the grocery, and the drugstore, suffice to permit a wide range of experiments, especially in elementary physics. Adherents of the sealing-wax-and-string school of laboratory practice will be delighted to see how much can be done with simple materials: "spring" balances from rubber bands or old automobile cushion springs; tripods, heaters, air ovens, and steam baths from tin cans; a Liebig condenser from an iron pipe, corks, and a glass tube; tweezers from strap iron; a sextant from bits of cork,

strips of wood, pieces of silvered glass, and a protractor; an aneroid barometer from a glass jar, a sheet of rubber, and a broom straw; used bottle caps tacked to a board in such a way that they intermesh to form a train of gears, and so on.

In addition to instructions for the preparation of apparatus and suggestions for experiments, there are general suggestions for teaching and there are appendixes of weights and measures, stars and planets, the elements, rocks and minerals, densities, heat constants, relative humidity, the Greek alphabet, and a list of source books and periodicals.

Although the book is directed to the secondary school, anyone concerned with science teaching, from the grade school to the university, should find some interesting ideas that he could adapt to his laboratory teaching. Perhaps the most wholesome effect the book will have in this country is to demonstrate that a piece of equipment does not have to be chrome-plated to be useful. The book may be obtained from the UNESCO Publications Center at 152 W. 42 Street, New York 36.—G. DuS.

#### Biology and Medicine

**A World Geography of Forest Resources.** Stephen Haden-Guest, John K. Wright, and Eileen M. Teclaff, Eds. for the American Geographical Society. Ronald Press, New York, 1956. 736 pp. Illus. + plates. \$12.50.

This handsome volume, *A World Geography of Forest Resources*, appears as a successor to the classic work by Zon and Sparhawk, *Forest Resources of the World*, published in 1923 and now both out of print and out of date. Unlike its predecessor, the present work is the fruit of specialized labor. It includes contributions from 35 authors, the majority from outside the United States. The editors have been generally successful in encouraging contributors to address themselves to a common purpose.

The purpose appears to be twofold: to provide a general and cosmopolitan summary of the relationship between forests and man and to furnish more detailed accounts of forests in each nation or region of the world. Introductory chapters deal with the importance of forests to man and with forest influences, the principles and practice of forestry, and the forest products industries. The outstanding contribution to this general section—partly, perhaps, because of its greater length—is Wendell Camp's "The forests of the past and present." In this chapter, Camp presents a splendid account of the development of forest vegetation through geologic time, in the light of a critical reading of the paleobotanical record.

The major portion of the volume is devoted to the 25 chapters concerned with national or regional forests. These chapters, naturally, vary in scope and quality, in part because of the varying concerns of the authors and in part because of the great diversity of forests and culture that marks the modern world. The typical chapter includes brief accounts of physical geography, the major forest associations, the history of forests and their present condition, wood-using industries and their impact on forests, and the development of forest policy and management. Some authors consider the ecology and successional relationships of important species and types; others touch on these biological matters only slightly or not at all.

Since the publication of Zon and Sparhawk's work, quantitative information about forests has multiplied, especially information on the extent and merchantable volume of commercially accessible areas and species. But the authors of the present volume have wisely minimized the presentation of detailed tables. These the interested reader can readily consult in the statistical publications of the United Nations Food and Agriculture Organization.

It is hard and perhaps unfair for the untraveled reviewer to cite chapters that are especially successful as regional accounts. But any such list, I believe, would have to include the chapters on middle America, western Europe, the Mediterranean, tropical Africa, the U.S.S.R. (by the late Raphael Zon), Japan, and Oceania.

At the end of the volume is a final, general essay, "The outlook for the world's forests and their chief products," by Erhard Rostlund, a geographer on the faculty of the University of California. This essay, despite occasional slackness of statement and organization, is a brilliant and stimulating discussion. Rostlund examines and challenges many of the facile shibboleths often found in the pages of popular and technical literature: that presently inaccessible forests will be developed to answer all the world's needs; that "the half-promise of technology" will enable us to recoup, in the factory, what we have lost on the land; and that silviculture, aided by genetics, will soon permit us to manipulate forest stands as readily as we manipulate field crops. Rostlund may exaggerate the extent to which these and other illusions affect our attitudes toward the forest resource. Yet he has set up no straw men, and his discussion, at the least, should help us to place some current fads in proper perspective.

The contributors, editors, and publisher deserve credit for supplying a section of 110 excellent photographs, which illustrate the great variety of species,

sites, and cultural environments involved in the concept of "forest."

The serious reader is not so well served, however, if he wishes to use this book as a starting point for further investigation. Eileen Teclaff's seven-page bibliographic note at the end of the volume is a good start, but it leaves many important gaps. Most of the regional chapters supply no more than a few citations on nomenclature. It is unfortunate that the editors did not insist on more adequate documentation and references for these chapters and thus make this excellent compendium even more useful.

HERBERT I. WINER  
*School of Forestry, Yale University*

**Theoretical Genetics.** Richard B. Goldschmidt. University of California Press, Berkeley, 1955. x + 563 pp. Illus. \$8.50.

This book treats of questions pertaining to the nature of the genic material and its action. Richard Goldschmidt, who in his experimental work and in his earlier theoretical discussions has made a large number of major contributions to our understanding of these problems, considers, in the present book, the status of his earlier ideas in the light of the recent evidence and discusses a number of questions which have arisen since his last book was written.

*Theoretical Genetics* is directed to the specialist in genetics, and its purpose is to present the point of view of the author to his colleagues and to support it with the available evidence. The book contains an extensive bibliography (50 pages), but it is not a review or a textbook in the usual sense, since it does not attempt to describe the material contained in the papers quoted. Frequently the experimental material contained in the papers is supposed to be known to the reader and is simply adduced to support the argument of the author. In other cases, the work is presented extensively and critically in its relation to the conceptual framework developed in the book. The book is conspicuous, in the biological literature, for the large number of verbatim quotations from the papers of other geneticists. These quotations usually embody the conclusions to which the other authors have come concerning the questions discussed. They serve, then, in the Aristotelian manner, as a starting point for Goldschmidt's development of his own ideas.

The book is divided into five parts of which the last two are relatively short, whereas the first three make up the bulk of the work. The arguments in all parts are closely interconnected, and cross ref-

erences are accordingly frequent. The first part deals with the nature of the genetic material. Mutation is assumed to represent a change in the pattern of the genic material, and this picture leads the author to represent the organization of the chromosome as consisting of overlapping segments of genic material which, in turn, are overlaid by patterns of a higher order, so that a hierarchical order of organization of the genic material results. After thorough review of the evidence, Goldschmidt arrives at the conclusion—different from that of the great majority of geneticists—that the genic material is represented by the protein constituents of the chromosome, and that the DNA has a function necessary for the self-reproduction of the genic protein material.

The second part of the book deals with the function of the cytoplasm. The author denies a genelike activity of cytoplasmic components and regards the cytoplasm as a more or less specific substrate for genic action. For this reason he rejects the term *plasmagene* as misleading, since the self-reproducing cytoplasmic constituents do not show the specific effects on developmental processes characteristic of genes.

The third part discusses the action of the genic material. The emphasis here is on genic action in the development of higher organisms rather than on the control of biochemical activities, derived mainly from the study of microorganisms. Goldschmidt points out that, for the control of developmental processes, one of the fundamental modes of action to be postulated for the genic material is "stratification"—that is, the orderly arrangement of materials in the cytoplasm. Furthermore, genes must be assumed to control the speed of developmental processes and the thresholds involved in determination and differentiation, as was pointed out by the author in his earlier work.

The final two chapters contain applications of the viewpoints presented on the balance theory of sex determination and on the author's well-known theory of the origin of higher taxonomic categories by "macromutations"—that is, fundamental changes in the pattern of genic organization.

Most geneticists will disagree with some of the points made in the course of the discussion, and the main disagreements will be different for different geneticists. In this connection, it should be remembered that many of Goldschmidt's views which, when first proposed in his earlier works, were disputed by the majority of his colleagues have in the intervening time found widespread acceptance.

It is impossible, in a short review, to give more than a slight indication of the